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Managing the information overload : a case study of managerial staff in a government department

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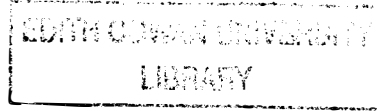
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Managing the Information Overload:

A Case Study of Managerial Staff in a Government Department

**A dissertation submitted in partial fulfilment of the requirements for the
award of Master of Science (Information Science)**

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At the Faculty of Communications, Health and Science

February 2000

DECLARATION

I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text.

Signature
Date 2/7 / 2000

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Abstract

Research shows that the amount of information available has grown vastly and information technology has greatly increased its availability. This has caused changes in the organisational environment, placing greater and greater demands on the individuals' and organisations' capacity to absorb and process information. Since information is considered to be a valuable and necessary asset, and as time for processing information is limited, an individual will have to make choices about what information to process.

An exploratory case study was conducted to ascertain what rationale do individuals in an organisational setting use for making decisions about what information to process from the vast amount of information directed at them. Eight staff members working on managerial level in a State Government department in Perth, Western Australia, were studied. Data were collected by conducting structured interviews, from documentary sources and by observing the participants.

As the study is an exploratory case study, no hypotheses were formed at the outset of the study, the data collection was guided by the research questions. The aim was to generate hypotheses for further studies.

Very little is known about how much of their daily information load individuals actually process. It is ineffective to bombard individuals with information, if it is not going to be processed. Before any kind of structuring of information or training of individuals can take place, it is necessary to know what the priorities are that guide the selection of information for processing.

The results of this study show that all the staff members interviewed had developed a similar strategy for dealing with their information loads. Their strategy reflected, in the first place, the authority structure of the department, and in the second place, their work priorities. In a complex and volatile information environment, dealing with increasing work and information loads, these managers and directors seem to have left behind the stage when they tried to process all the information they receive. It was also found that messages received through e-mail are perceived to have more urgent status than other communications, and that because e-mail is not subject to the same procedures as other methods of communications, it is causing new kinds of problems.

CHAPTER 1

INTRODUCTION

Information is essential for organisations as well as individuals.

An organisation processes information in order to reduce uncertainty and to resolve equivocality in the information inputs. The available technology, environment and organisational structure determine an organisation's information processing requirements. Information is acquired and processed by the individual members of the organisation. They process information selectively, as information in organisations is used for many purposes: decision making, a social symbol and a power resource (Choo, 1991).

On the other hand, large amounts of unsorted, unclassified information originating from mixture of reliable and unreliable sources become dysfunctional when constantly directed at individuals and organisations. This form of information loading is known as the Information Overload.

The concept of Information Overload has existed for decades.

Over the last hundred years, regardless of how growth is measured, information - or knowledge - has grown more or less exponentially, and the accessibility has grown equally dramatically. Between the years 1990 to 2000 the amount of information/knowledge is expected to double (Stewart, 1994).

Several studies and surveys have shown that the modern communications technology has resulted in people in academia being overwhelmed by the amount of information directed at

them (Pascoe, Applebee and Clayton, 1996; Barry and Squires, 1995; Herbig and Kramer, 1991).

The innovations in communications technology have also been held responsible for creating Information Overload in business organisations (Biggs, 1989; Königer and Janowitz, 1995; Benchmark Research, 1996). An international survey conducted by Benchmark Research for Reuters Business Information in Great Britain found that managers are caught in a dilemma. Faxes, e-mail, voice mail and the Internet clog up the organisational machine. While managers feel that they cannot operate without high levels of information, a heavy load of irrelevant data they receive daily affects their efficiency. Of those who reported themselves as suffering from Information Overload, 43 per cent believed themselves to suffer from ill health as a consequence (Benchmark Research, 1996).

Lars Marcusohn put forward a conceptual model of Information Overload, which identified several variables that determine an individual's information load. These include the organisational setting, part of which is the organisational culture, the nature of the information, time pressures and the individual's motivation (Marcusohn, 1995).

The Significance of Study

Studies done in the field of human information processing capacity have always been conducted in artificial situations, where the participants had to try to process all information given to them. Usually, in these studies participants are not provided with choices and they are not allowed to make decisions regarding which information to process. While these studies show that if an individual is faced with an increase in the amount or diversity of information, the person's capacity to process it decreases; they tell us nothing about an

individual in a situation where he/she has some choice if and when to process the information (Open University, 1974).

Individual strategies for coping with the Information Overload have also been studied, mainly by Miller and Wilson. They found that individuals employ various strategies in order to limit their information loads. These include omitting to process information altogether; filtering, i.e., disregarding some messages according to the individual's priorities; queuing, that is, leaving some messages for later, and, in extreme cases, withdrawing from the task altogether. (Miller, 1962, Wilson, 1996). There are several other studies which will be discussed later.

Given these pressures and influences on individuals with only limited time on their disposal and faced with a large quantity of information, how do they select what information to process? If individuals use coping strategies, such as filtering or queuing, what motivates them in their selection, i.e., on what basis is some information deemed to more important than others? It is self-evident that if individuals cannot process all the information directed at them, a selection process must take place. Even when a technological "filter" is used, such as filtering some e-mail messages, the user must decide what information is filtered in and out.

Societal and organisational culture has been identified by information scientists as having a significant influence on information processing in organisations (Huber, 1982; Marcusohn, 1995). Huber found that organisational performance and behaviour are so closely linked to organisational information processing that organisations could be viewed as information processing systems (Huber, 1982). Marcusohn proposes that organisational culture can be a major contributor to an individual's information overload (Marcusohn, 1995). Therefore, it is important that organisational culture is taken into consideration when the causes and consequences of information (over)load are studied.

Several information scientists recommend training in selection of information (Simpson & Prusak 1995, Königer & Janowitz 1995), but training cannot be of assistance as long as so little is known of the rationale of the decisions made by the user. Such training would assume that the rationale of the trainer coincides with the user, which is not necessarily the case if the demands of the organisational culture are not understood.

An exploratory case study was conducted, with the aim of studying individuals' decision making process in an organisation. The case study method allowed for studying individuals in a natural setting, where they have to make their decisions. It was also possible to take into consideration the nature of pressures specific to the organisation, as well as the culture of the organisation. Furthermore, it was possible to pursue in detail individual motivations or new leads emerging from the participants' comments. Ultimately, the aim was to find out which of the competing influences and pressures was the one that determined the individuals' information selection.

In order to establish this, data were needed about:

- the information needs of the managerial staff;
- the extent of their information loads, i.e., the volume of information they receive;
- what information the participants process, what they leave out;
- what the main influence is that determines what information to process.

Data were collected by interviewing eight members of the managerial staff. The amount of information they received was established by counting the number and type of communications directed at them within a day.

Statement of the Problem

Due to the explosive increase in available information in organisations, greater and greater demands are placed on individuals' and organisations' capability to absorb and process information. Time pressures and an individual's limited information processing capacity dictate that each individual must make choices what information to process, while on the other hand rationality demands that all available information must be processed. This study will investigate the individuals' decision-making process and the rationale used for deciding what information to process.

Research Questions

The main research question is:

What rationale do individuals in an organisation use for making decisions on what information to process, from the vast amount of information directed at them?

In order to try to gain a deeper insight into the individual's motivation as well as trying identify all relevant environmental influences, several sub-questions were used to guide the data collection. The first sub-question was rather general:

What factors influence this choice?

The next sub-question was:

Is the medium through which the information is received one of the factors?

Do different communication media have a different status? While the importance of information varies widely, does the medium through which it is received influence the recipients' view of the importance of information? Is the selection of information for processing dependent on media? These are the kinds of questions that this sub-question led to.

The last two sub-questions aimed to probe the participants' rationale for selecting information:

How much of the available information is judged to be important or useful?

What is the rationale for deciding if information is important or useful?

The first sub-question above will give a guide to the participants' estimation of their information loads, as well as into their definition of an 'important' piece of information. The second one, by establishing what the participants consider important, should throw light on the rationale.

Definition of Terms

The researcher has defined the terms that have not been attributed to authors.

Information Load

“The number of cues or pieces of information that are presented to a decision maker” (Schick, Gordon and Haka, 1990, p. 199).

Information Overload

“In an organisational context, information overload can be understood as the organisation’s demand and the individual’s own demand on himself/herself to process all information made available to him/her” (Marcusohn, 1995, p.27).

Workload

The number of tasks generated from the areas of responsibility that the individual has.

Information

“Information is data that has been processed into a form that is meaningful to the recipient and is of real or perceived value in current or prospective actions or decisions” (Davis and Olsson, 1985, p. 199).

“All explicit and implicit communication from any source can be considered inputs of information” (Marcusohn, 1995, p. 36).

Organisational Culture

“Organizational culture is the pattern of basic assumptions that a given group has invented, discovered, or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and, therefore, to be taught to new members as the correct way to perceive, think and feel in relation to those problems (Schein, 1984, p. 5).

Ministerial

A communication from the Minister's Office. It can be a request for advice or briefing on an issue, or an inquiry from another Minister or a Member of Parliament, or a letter from a member of public who requires a response.

REVIEW OF LITERATURE

General Literature

The concept of Information Overload originates from psychology, specifically from the work of J. G. Miller (Miller, 1962). Miller put forward the Human Information Processing Theory which studies the organisation of human perception. He stated that human perception involves selection and organisation of the environmental stimuli and transforming them into suitable inputs to whatever cognitive operation a person is undertaking at the moment. Miller conducted experiments into the amount of information a person can process efficiently. In these experiments information load was conceptualised as the amount of information input into a system (a human subject). Information Overload then refers to the overload caused by the presentation of stimulus information at rates too high for the system to accept.

Miller was interested in the limits of human processing capacity, and he found that as the information load increased, the amount of information output also increased initially. However, when the load is maintained at a high level, the output decreased (The Open University, 1974).

Psychologists have pursued the study of human information processing, but the concept of Information Overload was taken up next by information sociologists. In 1978, Orrin Klapp proposed a theory that the mass media's constant bombardment of the public with a stream of information has resulted in people feeling disconnected from it and to being bored by it. Klapp believed that trying to deal with a large quantity of information forces people to scan and skim instead of reading thoughtfully, and the feeling of disconnection follows (Klapp, quoted by Hopkins, 1995).

Similarly, Richard Wurman wrote that the ever increasing amount of information leads to a feeling of being overloaded or overwhelmed, and this in turn leads to feelings of frustration or anxiety: "Most of us are growing apprehensive about our seeming inability to deal with, understand, manipulate or comprehend the epidemic of data that increasingly dominated our lives" (Wurman, quoted by Hopkins, 1995, p. 305).

As the above literature survey suggests, the psychologists' way of viewing human beings as information processing systems with a limited capacity influenced other social scientists (Klapp, as quoted by Hopkins, 1995). They started to apply the concept to other situations in society, such as the public being overwhelmed by information from mass media. It is noticeable that the meaning of the concept Information Overload is changing; it is used to describe the amount of information available as well as the feeling of being overwhelmed by it.

Information Scientist and the Information Overload

In the 1970's, discussions started to take a place among librarians and information scientists on two connected issues: the vast increase in published materials as well as the technological

developments that made automated access to them possible, and the possible consequences of these developments.

The human information processing model (Miller, 1962) had also influenced the information scientists, and there was speculation that Information Overload may result from the vast amount of information available. At the same time, the same confusion over the exact meaning of the term also took place among information scientists as it had taken place among social scientists. Edward Wilson, writing in 1976, summarised the confusion as follows:

“Information Overload is again used in the literature in the sense that if you feed too much information to human beings, they will come down with ‘future shock’ or neurosis. This seems to be the basic meaning behind ‘Information Overload’, although no really coherent concept appears yet to have been attached to the words. They may sometimes be used to mean that too many demands for attention are being made, with resultant confusion or withdrawal by individuals. Sometimes they appear to mean that as knowledge increases in technical and professional fields, no practitioner can hope to keep up, and harmful frustration follows.” (Wilson, 1976, p.60)

The discussion continued for the next ten years, but the confusion of terms that Wilson wrote about were obviously not cleared up, because ten years later Mary Jo Rudd and Joel Rudd published an article touching on the same issues. They state that expressions such as information overload, information explosion, information glut, communication overload and communications explosion are being used to describe the increase in supply of information available, and they suggest that information explosion should only be used to describe that increase. Information load should be reserved for the amount of information acquired by the library user. The information load may or may not result in information overload, effect of

which can be confusion, decreased output and, in extreme cases, a system shutdown (Rudd & Rudd, 1986). The definition offered by the Rudds still maintains some connection with the original psychological concept and the view of human beings as information processing systems, but it has lost the precision of the measurement that Miller and others tried to establish.

Another ten years later, it seems that the original psychological aspect has been lost. In 1996, Patrick Wilson offers the following definition of Information Overload:

“Overload is more than the existence of very large amounts of information, enormous accumulation of publications, larger and larger data bases. Rather, it is the gap between what one can do and what one thinks one should do with existing information. Overload is a terrible problem for those in professional and managerial occupations.” (Wilson, 1996, p.22)

Wilson’s comment indicates that the accumulation of information through various means has become the accepted meaning of Information Overload. His definition refines the term further.

The Causes of Information Overload

The causes of Information Overload for librarians, information scientists and academics were summarised by Mary Biggs: “information overload [is] caused by the proliferation of available data and publications and evermore comprehensive and widespread automated means to them” (Biggs, 1989, p.411).

Information scientists have studied the causes of information overload mostly in the area of management studies. The extent of information overload among business managers was illustrated very clearly by a survey, commissioned by Reuters Business Information. The survey of 1313 managers was conducted in Britain, the USA, Australia, Singapore and Hong Kong. Of the managers surveyed, 49 per cent feel that they are unable to handle the volumes of information received (Benchmark Research, 1996).

Königer and Janowitz believe that information technology is creating part of the trouble. They write:

“The innovation of communication methods is so rapid that it continuously creates new complexity and technical finesse. ...These new forms of producing, distributing and retrieving information are continuously challenging our habitual methods of information handling. ...The paradox is that there is simultaneously too much and too little information created because, the information processing methods we have learned are inadequate for fast growth in the amount and the fast change in the ways of processing information” (Königer and Janowitz, 1995, p.6).

Königer and Janowitz argue that through information technology, information has lost the connection with its carrier, in other words, the medium can no longer be used as a reliable indicator of information type. Previously, the information user made a judgement about the importance and reliability of information by its source, for example, a quality newspaper, an item written by a well known authority in the field, or a textbook. When information arrives through electronic media, it causes the users to try to take in all of it uncritically (Königer & Janowitz, 1995). As some other information scientists, for example Simpson and Prusak

(1995), Königer and Janowitz (1995) believe that the answer is the structuring of the information by dimensions such as selection, time, hierarchy and sequence.

Other information scientists who have studied information (over)load in the context of business organisations, Perry Pascarella for example, believes that managers confuse information with knowledge, and due to this misunderstanding, people collect too much data/information and consequently suffer from information (over)load. Information can only be turned into knowledge by sorting and interpreting it. Pascarella advises that knowledge should be viewed as a process. Organisations should, instead of trying to control it, encourage corporate-wide participation and communication (Pascarella, 1997).

As the short summary above shows, the concept of Information Overload has moved from psychology to information sociology, information science and to the area of business management. In this last area another cause of Information Overload is considered to be the expansion of global telecommunications networks.

E-mail and Information Overload

The role of e-mail in the context of Information Overload has also been studied by the information scientists.

Rudy in a review of e-mail research discusses the two dimensions of e-mail research, media choice and media effect. Rudy concludes that Information Overload is an important area in the context of e-mail and the growing use of Internet, and that rather than thinking of e-mail as a unique technology, it should be thought of as just another way for humans to interact (Rudy, 1996).

Kettinger and Grover found that e-mail has become an important method of broadcast, task and social inter-organisational communication. Broadcast use includes public bulletin boards, list servers and discussion groups. Task use refers to communications required to accomplish group work, including information dissemination, problem solving and project coordination, while social use reflects the ability to participate in education/entertainment activities, to create and maintain personal contacts and to seek job diversion (Kettinger & Grover, 1997).

A study conducted by Bikson and Eveland (1990) found that people received more messages than they sent. Sproull and Kiesler (1992) raised the idea that e-mail increases the number of connections in an organisation and hence leading to increased information and workload.

According to a study conducted by D. Setton into how business executives deal with the barrage of e-mail/voice mail and faxes they receive daily, the motivation of staff was identified as one of the contributing factors for the information overload. The executives noticed that around promotion time everybody wants their names in front of their managers, and the amount of e-mail and voice mail increases hugely (Setton, 1997).

Relevant studies

It can then be seen that the literature on Information Overload tends to rather simplistically blame the amount of materials published, or, in the case of business managers, the new information and communications technologies.

In 1995, Lars Marcusohn put forward a conceptual model of Information Overload with several variables. These variables are Environmental Information Complexity, which is affected by the organisational setting and the nature of information, Individual Processing Capacity and the Individual's Needs and Desires. Finally, there are Coping and Information Discretion Strategies. The combination of all of the above determines individuals' Information Overload (Marcusohn, 1995).

Coping strategies that Marcusohn refers to are from the work of Miller (1962) and Wilson (1996). Both Miller and Wilson list seven ways used by individuals to deal with their Information Overload: (1) Omission, failing to process some of the information; (2) Error, processing information incorrectly; (3) Queuing, delaying during peak load periods hoping to catch up later; (4) Filtering, neglecting to process certain types of information, according to some scheme of priorities; (5) Approximation, cutting categories of discrimination (responding in a non-precise manner); (6) Multiple parallel processing, using parallel channels (decentralisation or group responses); (7) Escaping, withdrawal from the task.

The models by Marcusohn, Wilson and Miller are obviously of great relevance to the present study. However, while Marcusohn demonstrates the components of Information Overload on an individual in the work environment, and Wilson and Miller distinguish between various methods of coping with it, none of them answers the question about the rationale of the decision making, i.e., why an individual, in Wilson's terminology, decides to "filter", that is, neglects to process certain categories of information or neglects to process them altogether?

The aim of this study was to find information on this question.

Specific Studies Similar to the Current Study

L. Höglund has conducted a study into the motivations of information users. He found that “the greater the individual’s perception that increased information processing is instrumental to retaining his or her position, or advancing in the organisation, the greater the processing that will occur” (Höglund, quoted by Marcusohn, 1995, p. 29). The study suggests that the desire to advance in an organisation may then be one of the reasons what information is selected for processing by an individual.

With regard to the question the status of e-mail as a method of communication in organisations, Orlikowski & Yates suggest that that there will be an emergence of new norms when individuals are confronted with a new communications medium, and in the absence of explicit rules, simply transfer existing norms and established habits from a familiar situation to the new one (Orlikowski & Yates, 1994).

Contractor & Eisenberg (1990) proposed that the characteristics of the electronic media interact with the organisational norms in an adaptive process to achieve organisational and individual goals. Therefore, e-mail is not a substitute for the memo, but a complementary communication tool that facilitates new forms of organisational communication. For example, Markus & Robey (1998) in a study of e-mail usage found a convention they call ‘mosaic messages’, resulting from appending responses to received messages to create continuity and conversational context.

Literature on Methodology

In recent years, several researchers have recommended the use of qualitative research methods for studying aspects on information management and information science (Avison & Myers, 1995, Harvey & Myers, 1995).

Avison & Myers argue that Information Systems is a pluralistic field, founded on many other well-established disciplines. Therefore, no single discipline can capture all the complexity of an organisation, for example. Important insights can be gained by adopting an anthropological perspective. Anthropological concepts and methods facilitate the description and analysis of the social world in which information systems are used. Culture is very important concept in this context (Avison & Myers, 1995).

Information Scientists have used the concept of organisational culture to study the use of information technology in organisations. Laundon & Laundon suggest that 'In general, organisational cultures are far more powerful than information technologies' (Laundon & Laundon, 1991, p. 104). Stair found that organisational culture can 'have a significant impact on the development and operation of information systems within organisation' (Stair, 1992, p. 45).

In view of the findings of the studies quoted above, Avison & Myers (1995) believe case study to be a useful tool in this field.

Robert Yin recommends that an explanatory case study should be used when little is known about the phenomenon under study. He defines it as " hypothesis generating process; but its goal is not to conclude a study but to develop ideas for further study" (Yin, 1984, p. 19).

As it was pointed out above, very little is known about the rationale of an individual who makes a decision about what information to process. Höglund's study showed that individuals vary the amount of information they will process, depending on their motivation (Höglund, quoted by Marcusohn, 1995, p. 29). However, the study did not specify individuals' priorities in the selection process. The same applies to the study conducted by Wilson (1996), which classified the coping strategies but not what information was processed first. Therefore, the question requires exploration, not testing, and an exploratory case study is the most appropriate method.

Summary

Organisations acquire and internally disseminate information in order to carry out their critical functions. Individuals in organisations are the processors of this information. On the other hand, modern communications methods have increased the access to and the dissemination of information to such an extent that the concept of Information Overload came to be used to describe the situation when individuals and organisations are overwhelmed by the sheer amount of information directed at them.

The aim of this study was to find out how an individual, operating in an organisation, makes a selection from the received data for processing.

As several possible influences need to be taken into consideration, such as the information environment, organisational culture and the effect of new communications technology, case study method was chosen.

CHAPTER 2

METHODOLOGY

Case Study Method

Marcusohn's (1995) conceptual model of Information Overload identifies that an individual's information overload includes several variables such as the organisational setting, part of which is the organisation's culture, the nature of information and time pressures. All of these presumably affect an individual's choices of what information to process. It is important that the decision-making is studied in a naturalistic situation where an individual under such pressures has to decide what information to process and the case study method makes this possible.

The second advantage of a case study is that it allows for more detailed study of a small group of people. For example, such details as 'What do you read first' or 'What don't you ever read?' can be established and recorded. Also, the researcher is a staff member and therefore familiar with the types of information and processes in the department and she is able to be very specific about finding out things.

Thirdly, the researcher being a staff member made it possible to know what was happening in the organisation and what outside influences affected the organisation both from inside and from outside. For example, an event took place in community that had an impact on the department, the Minister's Office changed the instructions on briefings, and some

departmental services were in process of being outsourced. All of these had an impact on the workloads and information loads of the participants.

Theoretical Framework

There are several theoretical and philosophical assumptions made, based on theories of Information Overload, especially those proposed by Miller (1962), Wilson (1966) and Marcusohn (1995).

It is assumed that information is considered a valuable and important resource for an individual in an organisational setting.

Individuals working in an organisation are the processors of information that is required for fulfilling the organisation's mission. Therefore, information required for that purpose is obviously considered valuable. However, there are other reasons why the individuals in an organisation value information.

Marcusohn writes that the value of information is not based only on identified decisions, i.e., information is not only valued when it is connected directly with decision-making. Davis and Olson (1985), quoted by Marcusohn, propose three additional reasons for the value of information:

1. motivational - provides the individual with feedback on how he/she is performing;
2. model building - individuals information may support organisational learning and expertise building; and

3. background building - accumulating knowledge background utilised in decision making (Marcusohn, 1995).

Choo (1991) proposes further reasons why information is valued in an organisational setting. He quotes Feldman & March (1981) as follows:

“Organisational participants seem to find value in information that has no great decision making relevance. They gather information and do not use it. They ask for reports and do not read them... information use symbolises a commitment to rational choice. Displaying the symbol reaffirms the importance of this social value and signals personal and organisational competence” (Feldman & March, quoted by Choo, 1991, p. 55).

Another reason why individuals may value information is that it may be used as a political resource. An individual in control of an item of information may be able to influence decision-making in an organisation (Choo, 1991).

It is then necessary to establish what information is considered to be valuable by the managerial staff in the organisation for resolving the main research question: ‘What rationale do individuals in organisation use for making decisions on what information to process, from the vast amount of information directed to them?’

It is also assumed that, as Marcusohn proposes, rationality requires the utilisation of all available information for decision-making, and that this requirement contributes to the Information Overload (Marcusohn, 1995).

Furthermore, it is assumed that the following contribute to an individual's information overload:

- limited information processing capacity;
- the new communications technology;
- time pressure that exists in the workplace;
- the individuals' coping strategies, which may be effective or ineffective; and
- perceived value and importance of the piece of information under consideration.

These variables will be impacting on the research question.

The fact that human information processing capacity is limited is well established by research (Miller, 1962). It is not within the scope of this study to take into consideration the variations in human information processing capacities.

Individuals' motivation, their needs and desires are assumed to affect their choices. Höglund showed that the greater an individual's perception that increased information processing is instrumental to his/her advancing in an organisation, the greater the processing that will occur. A person can define the information processing requirements of his/her job either high or low, in other words, take on more processing if it seen to be the way to advancement. (Höglund, quoted by Marcusohn, 1995, p.29).

It is self-evident that time pressures exist in the work environment. There are some choices that an individual can make to handle information within the available time: 'filter' information, or process information outside work hours, for example. Several managers in

the organisation under study take home documents or come in to work at weekends to process their e-mail.

New information technology is producing new sources of information that are more diverse and more complex than anything seen before. These new forms of producing, distributing and retrieving information are continually challenging people's habitual methods of information handling. The new communications technology is a variable in this study because while people suffer from information overload, there is in many organisations a constant quest to improve and modernise their communications technology. It is also important to see if the new communication methods are used for all kinds of communications, from most formal instructions to informal requests.

Coping strategies are also variables, because they may be more or less effective. As mentioned previously, Miller and Wilson identified seven coping strategies (Miller, 1962; Wilson, 1996). According to them, nobody tried to cope by processing all the information. However, a person may use queuing, delaying during peak periods, hoping to catch up later. By applying these techniques, they will obviously process first what they consider to be the most urgent and important. So while a person may have a strategy which he/she considers to be useful in enabling him/her to process all the information, he/she is still making selections and choices.

Lastly, information in general may be considered by an individual to be more or less important. It is feasible that individuals consider the information directed at them to be only marginal for their work or redefine its importance.

Variables under investigation

It is assumed that there are several factors contributing to the Information Overload, such as time constraints, individual's information processing capacity, coping strategies and the perceived value of the information. Under these constraints, the individuals will vary in the amount of information they will process and in their rationale in choosing what information to process (Marcusohn, 1995).

If the amount of information processed by an individual is markedly larger or smaller than that processed by others, it may indicate different rationale and motivation from the others. It could also indicate a different perception of the importance of information. For this reason, the amount of information processed (from the total received by the individual) is one of the variables under investigation.

The next variable is the rationale used by the individuals for choosing information for processing. Presumably, an individual will decide if the information is important, marginally important, or not at all important

The individual's perception of what constitutes "important" will also be studied. The reasons why information is considered important may vary.

Lastly, the medium through which information is received is considered as an important variable. It seems likely that information received through electronic media may have a different status from paper documents. In the organisation under study, the some communications are always delivered on paper, Parliamentary Questions, for example.

Summary

While individuals in an organisation cannot perform their work without information, information is also valued for reasons other than being directly connected with the decision making.

Individuals have to select information for processing under several constraints, time being only one of them. This would indicate that they have to have very strict priority system and presumably do their selection accordingly.

CHAPTER 3

The Organisation

The organisation under study is the central office of a large government department in a capital city. Altogether, the department employs about 1400 people. Of those, around 350 work in the central office. The central office is responsible for the formulation of policy and strategies, administration and human resources, research and development, information technology planning and support, publicity and media relations and the outsourcing of services.

The main function, or the 'core business' of the department determines that information is collected from and about the community, processed and disseminated. The management of this process is taking increasing amounts of resources and time.

In terms of the authority or reporting structure the department resembles a pyramid, with the Minister on the top, the Chief Executive Officer below, followed by the executive directors, other directors and then the managers.

In 1997, the year before this study was conducted the department underwent a major restructure. This effected the information load of the individuals participating in the case study in various ways, which will be discussed later (see The Organisational Information Environment). The section dealing with information management and technologies was not restructured at the same time, instead the planning for one was in process while this study was conducted.

The Participants

Eight staff members were interviewed, three women and five men. All, except one who is in his early fifties, are in the 35 - 45 age bracket. Four are directors and three are managers. One participant, while on a managerial level and in charge of staff, is working on a special project and formally not titled a manager.

The participants work in six separate sections of the department. The aim was to have representation from as many different areas of the department as possible.

The Procedure

A request was made in writing, asking for permission to conduct a case study in the department (Appendix A). Each participant was given summary on the background and the aims of the study (Appendix B), and a consent form (Appendix C). The form also explained the right of the participants to withdraw any time and to address any concerns and questions to the researcher's supervisor. The researcher gave undertaking not to identify the department or the participants and to keep confidential anything disclosed to her in the course of the interviews.

The participants were interviewed twice, first time in September 1998, the second round of interviews took place in November 1998. The intention was to collect as much data as practicable, but during the first round of interviews it became clear that the participants had quite definite strategies for dealing with their information (over) loads. The second round of interviews was used to check with the participants that they agreed to the interpretation and to collect some more data. The interviews were recorded on tape recorder, then transcribed.

The participants were told that the interviews would take about half an hour. Once the interview had started, the interviewees did not seem concerned about the time, and several interviews lasted a full hour and at least one longer than that.

The interviews were semi-structured. All the participants were asked the same basic questions, but it was sometimes necessary to use different prompts or elaborate on the question (Appendix D). The questions were also intentionally open-ended, to encourage the respondents to elaborate and give examples, as well as express their feelings, and to give the researcher the chance to recognise possibilities of new questions and lines of investigation. The participants were interested in different aspects of the questions, but often also gave their view about what they saw as the problems in the information management in the department.

The first round of interviews aimed to establish what information participants required for doing their jobs, i.e., what were the information needs of each position. This would give the researcher an idea how wide ranging the participants' information needs are as well as how they defined their own information needs. It would presumably also identify information, that is directly related to identified tasks and decisions.

After establishing the information needs of each position, the next questions were intended to find out how much information the participants received, to get an idea of their information load as well as of their workload, and to see if there were substantial differences between information loads.

It was then established roughly what information is transmitted through which media (electronic or paper) to enable the researcher to find out if the channel of communication itself was a variable, i.e., the means of transmission and their impact on what information is processed.

The participants were also asked to count the number of communications they had received during that day and to state which category they fitted into, i.e. information related to main task/project; administrative/organisational; Ministerials; requests for information; progress reports from their staff and few others. Having established what the information was about, they were asked to state which ones they had processed and which ones they had left out. Were any of the pieces of information they had received of immediate importance/relevance? If so, why? Again, the aim was to get the participants to give their evaluation of what is important, i.e., the criteria for their selection for processing information. Simple questions such as 'Can you tell me what do you do first?' [when faced with all this information] and 'What do you read first?' started unravelling the participants' priorities and strategies.

On processing the results of the first round of interviews, the process and criteria for the selection of information for processing showed to be same for all the participants. They first scan through all the items of communications they have received, and check who it is from. They will then start the processing of the information according to the seniority of the senders within the departmental authority structure. Next, they will process communications related to their main tasks and projects. The participants were remarkably similar in what were the priorities for processing information and what was left out. This will be described in detail in the section "Information Processing Model".

The second round of interviews took place in November 1998. The interviews were planned from the results of the first (Appendix E). As mentioned above, the researcher believed she had discovered a pattern to the selection process. To verify the conclusions drawn, as well as to check against bias, the participants were asked if they agreed with the way the researcher had interpreted their strategies for selecting information for processing. They all agreed.

As it was done during the first round of interviews, a list was drafted of various categories of communication types, i.e., Ministerial, an administrative matter, agenda of meeting, etc., and presented to the participants, with the request that they check if the information they generally receive fits into these categories. They were then asked to go through the information they had received that day and to decide which categories they fitted into and to state what they had processed. This was intended to test their consistency in selecting information for processing.

The participants were then asked if they believed that their information loads have increased. If yes, what, in their opinion, was the cause of it? They were then asked several questions to test if they could be said to suffer from an Information Overload as defined by Marcusohn (1995). To further test their strategies for selecting information they were asked what would they do if they had to deal with even higher information loads in the future. The last question tried to find out if the participants felt that there is an organisational pressure to try process more and more information.

The last part of the structured data collection was to ask the participants to keep a 'diary' for a day in April 1999 (Appendix F). They made note of pieces of information they received, by the category and by the medium of transmission. It was anticipated that the results would give an indication of the causes of their information overload as well as the extent of it. For example, two persons may receive the same number of communications, but if one contains several Ministerials and another receives reports of work in progress, they cause significantly different workloads. As different kinds of information require different responses (Parliamentary Questions demand a quick response, on the other hand, notification of change in administrative procedures need just reading) the results could be used to gauge both workload and information load. Unfortunately, only six respondents were able to return their diaries, one had left the department by then and another was on an extended leave.

The last part of collecting information was by 'observation'. As the researcher works closer to some staff members than others and she is more familiar with some than others, all the participants did not come under the same amount of observation. However, even being able to observe the offices while interviewing was helpful. For example, one participant described his heavy information load, but his desk was always clear and uncluttered. Another pointed in despair to his three in-trays, crammed full of papers. When the participants later kept a diary of communications they received, it confirmed that the latter received more information. Informal chats during breaks were also helpful!

Problems of the Research Method

Before starting the case study, it seemed to the researcher that two issues might present a problem:

- In view of Marcusohn's hypothesis that rationality demands that all available information should be processed, the participants might feel that they should present themselves as individuals who process all information directed to them (Marcusohn, 1995). However, this did not prove to be a problem. It was by this stage a wellknown and accepted fact emerged: that a lot of unnecessary information was disseminated in the organisation (though nobody admitted to doing it) and nobody felt that they should or could process all the information they received. (This will be discussed later on in the section titled Organisational Information Environment).

2. Before starting the interviews, it was of some concern to the researcher that directors and managers may not want to be totally open and frank with a junior staff member on leaving information unprocessed or not being able to handle their information loads. It

seems that this may have happened in relation to one participant, 'T'. Unlike the others, 'T' did not criticise, even mildly, any aspect of information handling or management of information in the department and was the only one who believed that the staff are well informed of everything important. However, as the questions did not imply that anybody in particular is responsible for information (over)loads in the department, most participants were very open.

Processing the Results; Reliability and Validity

As the interview questions were mostly quite specific and involved the participants describing their actions and priorities, the processing of results was relatively simple. Similarities and patterns became obvious very quickly. The questions aimed at enabling the researcher to compare work and information loads dealt in simple quantitative numbers of e-mails, Ministerials received and the amount of time spent in processing these items of information.

The participants were asked to confirm in the second round of interviews that the interpretation of the method of selection they use for processing information was correct. The researcher decided to use quotes from the participants as often as possible, in the first place, to show how the conclusions were drawn from the evidence, and secondly to give the 'flavour' of the participants' responses. Obviously, both the checking of interview results with the participants and quoting them directly are intended to increase the reliability and validity of the findings.

Summary

Data were collected by semi-structured interviews, as well as by counting the number and types of communications each participant received.

The questions were designed to probe, both directly and indirectly, the basis of decisions made by the participants in relation to their information processing. The extent of their work and information loads were established by counting various pieces of communications they received.

CHAPTER 4

FINDINGS

The Organisational Information Environment

The organisational information environment in which the participants perform their work is very complex. There are several reasons for this. In the last five years, the department has gone through restructuring several times. The last and most major one took place in 1997, the year before this case study was conducted. Names of sections and units were changed their functions and responsibilities were redefined. New units, as well as new advisory bodies were created to collect and process information. Personnel obviously moved to new positions and responsibilities. The restructure affected the information loads of the participants at several ways:

Information was disseminated to the staff on the restructure itself. The participants received progress reports and information on changes that were taking place. The staff needed to spend time processing the information and learning the functions and responsibilities of newly named, or created, units and sections.

As predicted by Schneider (1987), creating new specialist units, task forces and councils to collect and process information actually increased the information load on some staff members, instead of easing it. The work of these bodies and the information collected by them has to be integrated into the department's knowledge base, a task that obviously falls on departmental staff. Two participants in particular experienced the impact, which created a significant increase in their information loads.

Another problem was caused by the changes in responsibilities and the movement of staff. Staff were not yet used to the new structure and they did not know who now was responsible for certain areas of the department's work. This complicated the procedure that Schneider terms as 'bootlegging', when the formal information system is circumvented and an informal system is relied upon (Schneider, 1987). In other words, staff members seeking information would approach other staff with knowledge or experience of that specific topic. Possibly due to the restructures in last few years, bootlegging has been practically institutionalised in the department. Now the networks had been disturbed again and new networks needed to be built. One participant described the situation as follows:

"They need a little bit of common sense, I think, within the organisation, that's the whole department, there is no clear delineation who does what, where and when, so it's only if you know the person or know the area you send letters to the right places. If you don't know the area you tend to send them to the top. If there was a better idea of the infrastructure in the whole organisation, you wouldn't send it to the top, you send it to someone half way up the ladder who could deal with it just as well as the person on the top. ...Within the organisation there is a tendency to go to people who provide service, and let them sort it out how they provide the service, whether it is their responsibility or not. "

Several of the participants commented on the lack of infrastructure under the new structure for collecting and disseminating information. The informant, quoted above, gave his assessment like this:

“I found this often in organisations, you have to have your own network and your own personal contacts, termed loosely as networking, because of the inefficiency of the organisation to show how the structure is supposed to work... A multitude of contacts need to be made to do the business. There is no networking structure. I have a reporting structure, but the reporting structure doesn't underlay the networking structure.”

Not only had the restructure disturbed the information networks, it had had another effect, as the first comment by the informant shows: the information load of the participants had increased because of the 'bootlegging' activities of staff. Because they did not know who was responsible for a specific area, personnel from other sections approached managers and directors directly with requests for information, the managers would then have to evaluate them and pass them on to the correct member of their staff, or advise the person making the request whom to approach.

In addition to the difficulties that resulted from the restructure, the amount of information directed to the staff has increased. Information dissemination through e-mail is largely responsible for this. At the time of the study, slightly fewer than 1400 users generated an average of 25,000 messages per day - approximately 17 each. Several participants commented that they received information not relevant to them, because some communications were directed to specific groups - all managers or all directors or both. There were complaints about the lack of planning and discrimination with information dissemination. Comments were also made to the effect that some sections and units broadcasted information to show that they were achieving something, rather than trying to be discriminating about who really required the information they were planning to broadcast.

The organisational information environment is also complicated by the fact that it is fragmented. The structure of the organisation is closest to a “functional design ... [which] tend to be highly differentiated, specialized by function, and difficult to integrate across the functions” (Schneider, 1987, p. 147). This was the case even before the restructure, which then created more units to manage specialised information and increased the differentiation. This specialised information now needs to be integrated. One of the symptoms of this differentiation is that until 1998, there had been no inventory of the various data bases and information systems in the department. Nobody knew what information was collected and a staff member researching a topic could never be quite sure that he/she was not duplicating work that had been done previously. When an inventory of information systems was undertaken, it became apparent that there were over 50 of such information systems of varying sizes. Access to the systems is carefully guarded and they are generally considered to be private resources of the unit or section maintaining them.

It is obvious then that the participants operate in a complex organisational setting.

Individuals' Information Environments

It was important for this study to try to establish whether the participants get the information they require and to determine if their information loads actually consist mostly of the information they need.

The participants were asked in the first place to define their information needs, i.e., what information they required for fulfilling the duties of the positions they hold.

The responses fitted into four categories:

- Information is required on the 'core business' of the section. This obviously means knowledge of the area the section or unit was set up to deal with, such as publicity, information technology, etc.
- Next, all expressed the need to be informed about the departmental direction, policies and strategies for the future.
- The participants also need knowledge about the Public Service and departmental procedures, such as budgeting, human resources and other management practices.
- Lastly, as managers and directors they need to know the progress of work their staff is undertaking.

In an attempt to quantify the participants' information loads, as well as compare them, during the interviews the participants were asked to count how many pieces of communication they had received during that day, through various media. Later, six of the participants kept a 'diary' for a day, making notes of communications in various categories, as well as of the media they received it through. The differences in the individual information environments were considerable.

One of the participants, 'B', was working on a single project with a long deadline of several months. On the other end of the scale, another participant, 'A', worked under an extremely high information load.

Marcusohn, quoting Driver et al. (1993) lists the major factors that contribute to the individual's environmental information load. These are:

- High time pressure, frequent deadlines

- Highly complex tasks
- High uncertainty, unpredictable events
- Important consequences
- Highly charged emotional environment (positive/negative).

At the opposite end obviously are no deadlines or time pressure, simple tasks, predictable events, unimportant or trivial consequences and neutral emotional environment (Marcusohn, 1995). Clearly, no manager or director can have such a low information load, but the participant 'B', working on a single project which had a long deadline with plenty of time for planning, operating with a 'positive emotional environment' to the extent that there were no sudden changes, unforeseen demands for information or controversy attached to the project, has had a relatively low information load.

In contrast, participant 'A' has the highest load in the most complex information environment. On the day the participants kept a diary of information/communications they received, 'A' listed 51 separate pieces. The participants with the next highest number of communications received 46. However, there was a great deal of difference in the content of their information loads.

'A's workload fulfils all the criteria for high information load. Of the total of 51 communications, 16 were Ministerials or Parliamentary Questions. Minister's Office requests briefings, advice or background information on issues, especially if the Minister is expecting to be questioned in the Parliament. Therefore, there are high time pressures and constant short deadlines attached to such requests. Uncertainty factor also is high, the Minister may be questioned on an event that is reported in the media that morning, so the consequences obviously are significant to both the department and the Minister.

‘A’ find this type of requests for information very demanding:

“My problem with information - my real problem with information is requests, Ministerial, Parliamentary Questions, briefing notes, budgeting and finance information. We are continually on call to provide more and more information. It starts a spiral, to answer the question you need information from four different sources, so we send an e-mail out to say this is what has happened, this is what we need, and then you have got to sort and decipher the information that comes back.”

Of the rest of the respondents, five out of six received more than 30 communications during the day they kept a diary, one had 10. With one exception, nobody else had as many Ministerials and Parliamentary Questions as ‘A’, and therefore not so many short deadlines or the same kind of pressure to provide detailed information at a short notice. The other participant with similar information load is ‘R’. Like ‘A’, ‘R’ responds to a large number of Ministerials and Parliamentary Questions, due to the position he is in. On the day when the participants kept a diary, ‘A’ had 16 and ‘R’ had 12 items of communications, fitting into the category Ministerials and Parliamentary Questions.

The highest number of e-mails received by a person during one day was 37, the lowest was seven. The bulk of messages for most were concerned with their main task/project, and therefore contained information they process as a priority.

However, it is clear that all participants have large information loads that consume large proportions of their working day - and time outside the working hours. The participants were asked to estimate the proportion of time they spent processing information. The

question referred only to the time spent on processing the incoming information/communications; letters, faxes and e-mails. Most estimated that they spent between 1-2 hours every day, some days up to three hours, on going through the information they received. 'A' spent an hour a day, and came to the office during the weekends for about three hours. 'T' came in at 7.30 every morning to go through his e-mail messages which he estimated took an hour, this participant also spent time during weekends processing his mail.

Appendix F shows the types of communications/information that the participants received. It should be noted that the participants did not fill their diaries on the same day. However, it is interesting to note that despite the comments made by the participants during the interviews about the number of e-mail broadcasts sent to all managers and directors, only two had received such a communication, one each. The largest category for all except one was information connected with a specific project or task. The exception was 'A' who received 14 items of information on ongoing projects or tasks and 16 Ministerials.

With one exception, the participants received more information through e-mail than on paper. The exception is again 'A'. He received 21 e-mails and 37 communications on paper. This is accounted for by the fact that Ministerials and Parliamentary Questions are sent on 'hard copy'.

In addition to the processing of electronic and paper mail, time spent in meetings and on the telephone as well needs to be considered to have a full appreciation of the information (over)loads of managers in this complex organisation.

While the information loads of the participants vary, they all spend a considerable proportion of their working days processing information from diverse sources. From that they then have to make a decision, what to process first.

Information Processing Model

In this department - and probably in all other Government departments - responding to Ministerials and Parliamentary Questions always takes priority over other work. If the Ministerial is not an urgent one and a reasonably long time line is given, it may be left until later. However, it should be noted that the respondents take it for granted that Ministerials take priority and always look for Ministerials first among their mail as potentially urgent information requests. Ministerials are distributed in distinctive colour folders to make them conspicuous.

Despite the variations in their information loads, the results of the first round of interviews showed that all the participants use the same methods and criteria for selecting information for processing. During the second round of interviews the 'model' was presented to them and they were asked if they agreed that it was the correct description of their technique. All the respondents agreed that the model was a correct representation of their information processing strategy.

Most - six out of eight - start their working day by going through their e-mail. One participant sometimes started with e-mail, sometimes with his in-tray. 'A' always begins with his three in-trays, because his workload consists of large numbers of Ministerials and Parliamentary questions and especially the latter often have extremely short deadlines.

Whether the participants begin with their e-mail or the paper documents, they all use the same process. They scan through the list of senders' names on their e-mail or letters and memos.

The first criterion is the seniority of the sender. The participants expressed this in the following ways:

‘...but I look at it straight away if it’s something obviously from the Executive Management, then I try ‘addressing’ it as soon as possible. So it’s a priority system.’

‘And if I get one from ‘GW’ or other directors or managers, I would get stuck into those straight away...So I tend to work from top to down.’

And:

‘Some information is [more] important, I mean some people would say anything ‘FD’ or ‘CS’ [two executive directors] said is important, anything my boss said for instance is probably important too...’

Or:

“But I don’t always respond to e-mail as soon as I have to. Probably it’s sort on interrelationship, if ‘D’ sends you an e-mail - ‘D’ being my boss - then probably you respond to it instantly because it’s sort of like him seeing you in corridor.”

The first criterion then reflects the authority structure of the department: Ministerial correspondence is processed first to check when it is required. Next, any messages from Senior Executive, then from other directors and managers.

The second criterion is the task relatedness of the communication. The respondents will look for any information related directly to their major projects and tasks. This can be

progress reports and questions or general information from their staff, or additional information they have requested, possibly from other sections or departments.

The participants described this the following way:

“...It’s got to be a project that is either about to happen or is happening. It’s got to be relevant to something in terms where the organisation is going.”

“I have a list of things that are critical and need to be done, I work my way through that, and because I scan things I know what I have got and can go back to them if they relate to those things. If there is nothing on that list I can action at the time, then I go back to my pile and sort and classify it. But essentially the information I use is the information related to the tasks.”

“Things we are working on now and things we have to do something with now...”

“I have in my mind a model of what my tasks are going to be over, say, the next six months, over the next period and so I seek out information that is relevant to completing those tasks, whatever category it might be in. On more short term if I’m doing a particular activity I will find out information that I believe helps me to achieve the outcome of that activity.”

After checking all project-related information, the participants will scan other messages to see if there are instructions/requests and what kind of time lines these have. These might be reporting requirements by the administration, requests for information from other

sections, etc. If the deadline is short, the message has to be processed straight away, i.e., either responded to or passed on to the appropriate staff members with instructions.

The third criterion for selecting information for processing is the identity of the sender. The participants process information from colleagues, if they consider the sender a valuable and reliable source of information. Several of the participants commented on the lack of infrastructure in the department for gathering information from, or passing it to the appropriate staff member. Therefore, it is important that staff members are alerted to developments that have a bearing on their areas of responsibilities. One informant's comment was fairly typical:

“My main source [for information] is ‘X’ Unit... ‘Y’ passes on information controversial issues, policy issues and strategic plans. ...It relies on the people there, most of my networking is with the ‘X’ Unit... I’m looking to establish something more formal so contentious issues will come down to me, at the moment, whoever is up there sends it down. It’s only as good as people who do it.”

These are the priorities of the participants which dictate their strategy for information processing.

So what information do the participants leave unprocessed? Again, their responses were very similar.

- Information may be ignored because it is not clear how it is related to or connected with the present concerns:

INFORMATION PROCESSING MODEL

Priorities for processing information

- 1** Ministerials and Parliamentary Questions
- 2** Chief Executive Officer
- 3** Executive Directors
- 4** Peers: Directors, Managers
- 5** Information on main task / project
- 6** New instructions / tasks: check timelines
- 7** Information from a reliable colleague

Information not processed

In no order of priority

- ◆ Status not clear how related to present priorities
- ◆ Copies of information, originals addressed to somebody else, i.e., cc in front of name
- ◆ Updates / new administrative procedures
- ◆ Unsolicited commercial information
- ◆ Groupwise newsletter
- ◆ Social club newsletter
- ◆ Requests for information from junior staff

Figure 1. The Information Processing Model.

“...then there is stuff that is new or I don’t know what to do with it because I know it’s related to something that I haven’t been involved and we may not have anything to do with it but we know it’s going to come up later in life.”

“Stuff from Eastern States, they will send us things like that. And I will just read them and remember for about two months that I read it, then it just gets filed. But I know that at some stage, because I’m busy and I haven’t had time to think about it I will have to do something about it before a major event hits.”

- Copies of information that has originally been addressed to somebody else, i.e., anything which has cc. in front of the recipient’s name.
- Several mentioned that they frequently received information on changes/updates to administrative procedures but never had the time to read them.
- Unsolicited, commercial information generally is left out. Some participants, because of working in communications technology area, received large amounts of such information.
- At the time of the interviews, the department had had a new e-mail and communications system, called Groupwise, installed and the information technology section mailed to all staff an electronic newsletter which was really a manual on how to use the new system. The participants disregarded the Groupwise newsletter.
- Social club newsletters were also disregarded.

- Lastly, three participants mentioned spontaneously that they leave e-mail messages from junior staff members unprocessed, especially when they are working under time pressure.

“So I tend to work from top to down. It doesn’t mean that those lower down are less important, it’s just if I get something from the top I need to do something about it and sometimes I’m not given a lot of time to do it.”

“...and I automatically e-mail them back or whatever communications came through to me...and actually say could you please put this through line management as my directions actually come from the Executive Director. ...So people actually don’t think so much what they are sending. Whereas in the old system if you actually had to formally type something up and send it to the typing pool and get it back and proof read it and send it to your boss to get signed off, people actually really thought whether what they actually wanted was a legitimate request or not.”

“ So it creates a big problem for me sometimes in that I will get a request from someone who I know, but I don’t know why they need the information or for what purpose or what sanction they have for seeking it. So then you are in position of deciding do you just ignore this request or do you send them back through bureaucratic and official channels to get what really could be a simple thing?”

The last informant added that if he is not too busy he will comply with the requests, but gave the impression that generally he does not. The researcher, being a junior staff member in the department, can vouch for it that this is a common device for limiting information loads.

Summary

The department is a large one and has a complex structure. The participants' organisational information environments had been further complicated by the restructuring the department has undergone in the last few years. The changes have contributed considerably to the participants' information loads.

The individual information loads were estimated from the number and type of information each received, as well as using a method of analysis developed by Driver et al. (1993).

It became clear that all used similar information selection strategy, which reflects the authority structure of the department.

CHAPTER 5

Comments on the Findings

It was shown earlier that the participants operate in a very complex and volatile organisational information environment. The availability of the modern communications technology also means that they receive communications and information through diverse media: on paper documents, through e-mail, faxes, telephone and meetings. Königer and Janowitz (1995) suggest that because of the mixture of communications media, the medium itself can not be used any longer as a reliable indicator of the type and importance of the information, and the receivers have to process all information to judge its relevancy. While the most 'formal' communications in the department still are documented on paper - Ministerials, Parliamentary Questions, or the departmental finances - there has been a shift to using e-mail for communications. As there is no clear cut guidelines as to what should be documented on paper and what exactly is the status of e-mail communications, there is no doubt that the electronic media caused an increase in information processing in the manner predicted by Königer and Janowitz (1995).

These are the circumstances then in which the participants have defined their priorities and developed their strategy for selecting information for processing. As it was discovered, they all used the same strategy.

In the first place, the strategy reflects the authority structure of the department. The first priority is to become aware and respond to the messages and instructions from the Minister's Office, from the Senior Executive and fellow managers and directors.

Except for the Minister's Office, the senior staff use e-mail largely for communicating. In order to be aware of new messages, some participants have an alarm system on their e-mail to alert them when new mail arrives, others check their e-mail every hour or half an hour, one leaves his open to be able to check it quickly. Conversely, at least three leave messages from junior staff unprocessed, again indicating that the seniority of the sender is an important criterion when the decision is made about processing or not processing messages.

The fact that the participants keep checking their e-mail constantly indicates that the senior staff members expect their messages to be responded to immediately, and that the onus is on the receiver to be alert to new messages.

It also demonstrates the practice in the department of sending e-mail even when something has to be done/arranged at a short notice. Again, it is assumed that the staff are at their desks at all times, and that they check for new messages at short intervals. This assumption and the practice were also a source of irritation to many other staff members who did not participate in the study. It also increased the information load for the participants, because they had to constantly stop whatever they were doing and check their e-mail.

As was shown earlier by the quotes from the participants, they take it for granted that they attend first to messages from the senior management. This seems an aspect of the organisational culture, and e-mail usage reflects it. This looks likely to be the case because only one of the participants claimed to constantly receive urgent instructions from their senior officers, but, as the quotes show, what is considered to be important is to be aware of the message and to respond to it quickly.

It seems then that the organisational culture dictates the first criterion for the selection of information for processing. It then has become a task in itself, being alert to and responding

to communications from senior officers. Next, the participants looked for information on their projects and tasks, obviously a necessity so that they can perform their work. If it is accepted that within the department responding to one's senior officers' communications and requests is considered to be one of the major tasks, this strategy identifies the information that is directly relevant to the individual's decision-making with regard to his/her workload.

Marcusohn (1995) suggests that if the value of information were based only on identified decisions, much of information within organisations would have no value. Davis and Olson (1985) proposed that information is also valued because it provides feedback on the individual's performance (motivational value), it supports organisation learning (model building), and it assists an individual in building background knowledge and expertise (background building).

In this study it was found that although the participants respond to their supervisors' e-mail promptly, they value the information first and foremost when it is relevant to their decision-making on projects and tasks.

The participants receive so many items of communications that they have to take extra time to go through it to decide if it is relevant or not. That decision-making process itself now takes some of their time, often outside working hours. It seems likely that because of increased information load the participants have to try to mostly cope with their workload and information directly connected with it. The participants were of course aware of the importance of background building. Several attended seminars and conferences, some were members of e-mail groups trying to keep up with professional development in their areas or received journal articles, but any time spent on these activities meant that there was more information processing to work through. One commented that only time he has for reading

reports of research is when he is travelling on an aeroplane. Another described his method of coping as follows:

“At the moment what I take home is my general reading, that I know [it] is not critical but I have to have the information at some stage, or I have to know that it's there. I don't necessarily have to remember what it is as long as I know that I have got it and can retrieve it and I can usually hold that information for about three months before I lose it.”

Of the eight participants interviewed, five described themselves having to deal daily with such a large information load that they had no time for processing information other than directly related to their tasks. In other words, information that is valuable for other reasons, as defined by Davis and Olson (1985), has to be left to some future date. It seems possible that since Davis and Olson's study was conducted in 1985, before the increase in information due to the modern communications technology, staff in organisations had more time and less information for processing and had more choices when selecting information for processing.

A situation that the participants would recognise easily is described in a survey, conducted for Reuters by Benchmark Research, of 1313 managers in Britain, the USA, Australia, Singapore and Hong Kong. Of the managers interviewed, 49 percent felt that they were unable to handle the volume of information they received and 47 percent said that collecting information distracts them from their main responsibilities. Of those who reported themselves suffering from information overload, 43 percent are believed to suffer from ill health as a direct consequence. Most, 94 per cent, do not believe that the situation will improve (Benchmark Research, 1996).

Under similar information loads, the participants in this study have defined their immediate priorities as being responsive to the needs of the senior staff in the department, and processing project/task related information.

As the managers in the Benchmark Research survey for Reuters, the participants did not believe that their information loads would be less in future. Six out of eight anticipated an increase, one was uncertain, one thought his load would be about the same. However, it was interesting that several had gone through the stage of trying to deal with all information directed to them as described in Reuters study, and found it impossible and counter productive. To the question ‘Do you feel you should be able to process all information you receive?’ the participants responded with the following comments:

“I think for the first 12 months [in the position] I tried, and then came to the realisation that I couldn’t and I don’t think anybody could. If they had no other life and worked 16 hours a day, they might be able to keep on top of the things.”

“No, I don’t feel that any more. I used to, but there is a point you get to, well personally I got to, where I could read 24 hours a day but then it’s not worth anything. So I suppose it’s about implementing your own strategies. There is always more information than you are ever going to be able to retain.”

“Because I used to be able to do it, therefore why can’t I do it now? It’s the gut feeling but the head says it’s because there has been so many changes and there is so much more information around and that it’s very difficult. So intellectually I know that but it doesn’t stop me thinking that I should be able to.”

It seems that the participants have got over the stage when they tried to process all the information - the stage the managers in the Benchmark study were going through - and moved to a new one, when they acknowledge that the fight was hopeless. At this stage, they obviously have had to put in the place a strategy for surviving under their information loads.

The participants were asked what they would do if there were an increase in their information loads. Again, several had similar strategies in mind:

“I would share up the work...I’d shed work. I would go to the people who work for me and work out what’s the least risky and leave it [out]. And when the pressure is off, bring it back to the agenda.”

“I think what I’ll try to do is to deal with the most important issues. Those that are critical to the branch or critical to the organisation and anything else will just have to take a second place and if it doesn’t get dealt with that’s the way it is, it just gets left.”

“I guess part of it is the weeding process that you do in the first instance. It’s survival mechanism in terms of all these people want me to know this stuff, I can’t possibly know it all so I have got to weed out. ...In that weeding process you actually are putting yourself at risk in terms of there may be material that you should have read or you should know about... So there is always that balance that you play off how much you can cope with the risk of not knowing... I think as a manager that one of the hardest things is to weigh up that risk factor... I think I would have to be more strategic about it, I would increase my risk level

and therefore weed out more and more and hope that what I'm weeding out is not absolutely essential."

One of the participants thought he might try to organise his time better if his information load is increased. Another said that he would try to increase his working hours to see if he could manage more information processing, but he concluded stating that "If I can't, I can't."

These comments demonstrate that most of the participants felt that they were spending the maximum time available to them for information processing at the present moment. The comments also illustrate that they are not experiencing Information Overload as defined by Marcusohn:

"The organisation's demand and the individuals own demand on himself/herself to process all information made available to him/her" (Marcusohn, 1995, p. 27).

While the participants felt that there is an organisational demand to process all the information, their responses show that having tried to do so, they do not believe any more that such a requirement is rational. Rather, they believe that due to a poor information dissemination policy in the department, they are overloaded with a lot of information that is not relevant to them.

The Role of E-mail in Information Load

One of the research questions investigated the significance of the medium of communication for information load. In other words, does it make a difference to the participants through what medium the information is delivered?

The participants found that e-mail has added to their information load in several different ways. The amount of information disseminated through e-mail itself has risen steadily. Unfortunately figures were not available for the period before 1998 when a more sophisticated e-mail system was installed. However, in June 1998, when the central office roll out was complete, 390 staff sent out 6,000 messages per day - 15 each. At the end of the November the same year the number of users had increased to 950, and 18,000 messages were sent out daily (18 per each staff member). At the end of the roll out in January 1999 there were 1400 people sending out 25,000 e-mails every day or 17 each. One of the participants speculated that informing staff about the restructure of the department caused the increase, and as the process was completed messages got slightly fewer. The actual amount of information then has increased, even in the short period of time for which statistics were available.

Several of the participants also expressed a feeling that e-mail, as a method of communication, is felt to be more urgent than messages on paper (letter or fax).

“ I check my e-mail every hour, at least once an hour, the sort of e-mail we get now can't wait, like with the paper stuff coming in you can say alright, you can do one hour in the morning and deal with it - you can't - e-mail is much more immediate than that and you can't say I will do it at the beginning and the end of the day - you have to do it regularly.”

“No, I perceive them [e-mail messages] as being more immediate. There is almost a culture about the e-mail, which is like fax used to be, that you will handle fax more quickly than you will a letter. You tend to handle your e-mail more quickly and also the technology tends to drive it that way.”

“I tend to feel like, if it’s something sitting on my desk it can wait. But e-mail sometimes to me has a sense of being more urgent, like there needs to be a response and a reply, people need to know that you have seen and read it. Whereas paper information is just there for you to read, it is not requesting a reply. ...All the stuff that comes across my desk, I don’t write back to people saying thanks for the information.”

The comments above illustrate the feeling that e-mail messages have a different status from those on paper, it requires a response and often an immediate one. As a channel of communication, it has added to the time pressures, as well causing changes in the work habits.

Another change regarding the work practice, mentioned by several participants, is what one of them called “the agonising on e-mail.” He also described this as “people working through stuff and thinking aloud.” This takes place when his staff members are working jointly on a task and have a discussion about it over the e-mail, all of which they also forward to their manager/director. It was also reported that after the task is completed, the senior officer is sent all the discussions in the way of report, rather than just a summary of the outcomes. One of the participants added, in the same context, that he was aware when two of his staff were exchanging messages on a task and forwarding him the exchanges, that one of them was doing it to ensure that the director/manager was aware of the junior officer’s reasons for taking decisions. Generally the participants agreed that the information they received this way was ‘bitsy’ and they would have preferred a summary of the outcomes.

It seems that e-mail has had the effect of making reporting to senior officers much less formal. The participants perceived that this has caused increase in their workloads because of

having to read and respond to the e-mail discussions their staff were holding. Markus & Robey (1988) called this style of communication 'mosaic messages', the communications that result from responses being attached to the messages and sent back again.

Other consequences of e-mail communication on the participants' information loads were 'bootlegging', i.e., circumventing the formal information flow system by an informal one by the staff in the department and forcing the participants to check their e-mails at short intervals. Both have had disrupting effects on the participants' productivity during the course of the working day.

It seems that as e-mail is a relatively new communication method, it is not subject to the same bureaucratic protocols as other communications in the department. Paper documents, meetings and telephone contacts all have established procedures, but for the present at least, e-mail seems to bypass that – and it is used to by-pass it.

One by-product of this lack of protocol, for example, has been the requests for information stated by the participants earlier, when junior staff members approach the participants with requests without explaining the reason for it or citing their authority for doing so. This means that the participants have to deal with these and make decisions about them continuously, whereas previously they would have been shielded from such direct requests. As reported by Sproull & Kiesler (1992), the use of e-mail has increased the number of connections and interactions in the organisation. However, these increases of connections together with the new informal approach by junior staff to seek information have not been wholeheartedly welcomed by the managerial staff. Sproull & Kiesler (1992) predicted in the same study that the increasing number of connections will result in an increase in workloads, as has been the case in this organisation.

It was seen earlier that three of the participants admitted to not responding to these requests from junior staff, and one said that he sent the inquirers a message advising them to use the proper channels. These seem like attempts to bring e-mail under the same procedures as other communications in the department. The procedures and protocols in the department control the flow of communications and, to some extent at least, keep paper-based communication predictable and easier to classify in order of priority when the authority behind the requests was formally stated on the paper.

It appears that possibly due to the relative newness of e-mail as a method of communication in the department, it has a different status from other communications. It is perceived to be more urgent and it has changed the channels of communications. In other words, as medium of communication, it has had considerable effect on the information loads of the participants.

Implications

Königer and Janowitz (1995) as well as Simpson and Prusak (1995) recommend that information users should be trained to analyse information they receive according to various dimensions, such as time, hierarchy and sequence. This approach makes the problem of too much information the responsibility of the recipients and leaves them to deal with it.

From this limited case study, it seems that the problem is rather the lack of guidelines and policy on information dissemination in the department. It is unfortunate that the participants were not asked how many e-mails, faxes, letters or memos each sent themselves in one day. It would have been interesting to know how much of the information load was caused actually by the participants of this study. However, it was very clear that generally other

units and sections were accused of sending irrelevant information or not being discerning about to whom it was sent.

Previous studies (Kettinger & Grover, 1997, Bikson & Eveland, 1990) indicate that e-mail is used extensively for broadcasting in organisations - included in this are also bulletin boards, list servers and discussion groups - and that people received more messages themselves than they send out. Kettinger and Grove (1997) believe that the broadcast dimension of e-mail communication makes this medium one of the main contributors to the information overload.

In view of the above findings and the finding of this study, it would seem then that it could be more useful to train staff and/or develop strict guidelines for information dissemination in organisations, rather than trying to teach them to be more discriminating about the information they receive.

The participants in this study found the irrelevant information they received irritating and time wasting, and they were critical of the personnel in other sections who sent the messages. As many of the communications are disregarded, it can be said that the senders/broadcasters also waste their time and resources.

Also, in view of the fact that the participants had such a high work and information loads that their first priority was to process the information strictly related to their tasks and projects, it seems unlikely that training would be of much practical assistance.

In addition, since the authority structure of the department is a decisive factor in the selection of information for processing, training becomes irrelevant. If there is a prevalent culture in the organisation that senior management send instructions haphazardly any time and expect an immediate response, then this becomes a priority, as it was seen.

Another aspect of the departmental culture was perceived by the participants to be the broadcasting of information solely for the purpose of informing the rest of the department of the achievements of one section or unit. If the participants interpreted the motive for such broadcasts correctly, it seems likely that such broadcasting will increase in future, as all the sections and units will also find it necessary to publicise their achievements. Again, learning to be more discriminating about what information is broadcasted to whom it would be addressed would put the responsibility on the senders, rather than leaving the recipients to deal with it.

For the above reasons it is suggested that in an organisation, such as the one under study, training the recipients of information to be more selective would not provide the answer to the information (over)load of the managerial staff.

Summary

It was seen that the participants' information processing strategy reflects the authority structure on the department. The use of e-mail in the department illustrated this very clearly, the participants checked their e-mail constantly to make sure they would be aware of any messages from their senior officers.

Processing information related to their tasks takes so much of the participants' time that they find it difficult to have time for other kinds of information, such as background building. Most of the participants believe that the amount of information they process at the moment is the maximum possible.

E-mail has increased the participants' information load in various ways, largely, it seems, because the established departmental procedures for communications do not apply to its use.

Conclusion

Marcusohn (1995) hypothesised that the environmental information complexity sets the framework for individual's information load. Organisational setting, nature of the information, individual processing capacity and the individual's needs and desires are all components of information load. These can be off set by the person's coping strategies and information discretion strategies. This study looked at the effects of environmental information complexity, the organisational setting, the nature and amount of information in making up an individual's information loads.

It was found that the organisational information environment, the demand for more and more detailed information and the departmental policies and practices regarding information dissemination all have an effect on the managerial staff's information load - or overload.

Under the circumstances, the participants have developed a coping strategy which enables them to respond to the organisational priorities and manage their workloads by learning to disregard unessential information. This study found that these priorities reflected the authority structure of the department and the participants' work priorities. It also found that the individuals have moved from the stage when they tried to process all the information they received. Lastly, it was discovered that the medium of communication makes a difference to the information processing priorities; e-mail as a communication medium is generally perceived as carrier of more immediate, even more urgent messages.

Further Research

As with all case studies, the results can be generalised only to a very limited extent.

The organisation during the time of the study was in a very volatile state as a consequence of the restructure, which had created new decision mechanisms. In addition, the upgrade in information technologies had caused an increase in communications and created new channels for them. The restructure and the new technology both had the effect of increasing the participants' information loads.

A study conducted in an organisation with a stable structure and a well-established formal information collecting/dissemination mechanism might show different results. Such a study would allow for the comparison of individuals' priorities and rationale when organisational information environment is a less dominant factor, and further refine the knowledge of this area. It would also show whether the authority structure determines the information processing priorities in other organisations.

Alternatively, a survey could be conducted, including more participants in several organisations. The findings of this study could assist in designing a questionnaire that would probe deeper into individuals' motivation and rationale for information processing in an organisation.

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Request for a Permission to Conduct a Case Study

I am seeking a permission to conduct a case study in the department, to be used as basis of my thesis for M.Sc. (Information Science).

Background

Research shows that fast growth of information and technology that makes it available have caused changes in the organisational environment, placing larger and larger demands on the individuals' and organisations' capacity to absorb and process information. Time pressure and an individual's limited information processing capacity dictate that each individual must make choices about what information to process, while on the other hand rationality demands that all available information must be processed.

Very little is known about how much of their daily information load individuals actually process, and nothing about what kind of rationale an individual uses for making a decision about what information to process.

The Proposed Study

I intend to conduct an exploratory case study. The aim is to study at least six staff members on managerial level. I plan to collect data from interviews, documents and by observation.

Specifically, I would like to be able to interview the managers three times over the period of six months. I would like to make a list of all data and information they received on one day, for example, and then establish what information they have processed and their rationale for doing so. By observation I mean in this case that as I work in the department, I am in position to talk to managers informally.

Confidentiality

I am fully aware of the question of confidentiality. I would like to emphasise that I am not asking for a permission to read documents, only to establish how many there are, where the information is coming from and what the subject is.

I undertake not to identify the department or the individuals.

Implications

I believe that in addition to adding to the knowledge on individual's information overload, this study can assist with the planning of information dissemination in organisations. It is ineffective to bombard staff with information if they do not process it. Also, research shows that while staff in organisations are overwhelmed by information, they are not getting the information they want and need.

If permitted, I will conduct the interviews during the working hours, mostly because I anticipate that staff would not want to stay after hours to participate. I will make this time up. All the analysis of data and writing up will take place outside work hours.

Appendix B

Request for Your Participation in a Case Study

I have been given a permission to conduct a case study in the department, for my thesis for M.Sc. (Information Science). I am requesting your participation.

Background

Research shows that fast growth of information and the technology that makes it available has caused changes in the organisational environment, placing ever increasing demands on the individuals' and organisations' capacity to absorb and process information. Time pressure and an individual's limited information processing capacity dictate that each individual must make choices about what information to process, while on the other hand rationality demands that all available information must be processed.

Very little is known about how much of their daily information load individuals actually process, and nothing about what kind of rationale an individual uses for making a decision about what information to process.

The Proposed Study

I intend to conduct an exploratory case study. The aim is to study at least six staff members of managerial level. I plan to collect data from interviews, documents and by informal discussions whenever possible.

If you agree to participate, I would like to interview you two times at six week intervals.

In addition, I would like to make a list of all information you have received that day. This would include:

- letters, memoranda, other communiques;
- agendas, announcements, minutes of meetings;
- administrative documents - proposals, progress reports, other internal documents, and
- articles, journal, reports.

These can be received through any media; paper, E-mail, fax, voice mail, a telephone conference.

If you consider it acceptable, I will collect all the information, make a note of the content, source and the medium, return it straightaway and then interview you about which information you have processed and how you made the selection.

Your Rights

I undertake not to identify the department or the participating individuals, and treat as confidential everything I read or am told.

You have the right to withdraw any time from the study.

Should you wish to discuss this with a representative from the Edith Cowan University, Dr Gulden Wagner, who is my Supervisor, can be contacted on 9370 6268.

Needless to say, I would very much appreciate your cooperation.

Appendix C

Agreement to Participate in the Proposed Case Study

I have read the Request for Your Participation in a Case Study and agree to participate.
I understand that all information I give will be treated as strictly confidential and that I
can withdraw from the study any time.

Signature

Date

Interview 1

What are the information requirements of this position? what information do you need to do your job?

For example, information related to the 'core business' of your section, administrative/organisational, background information?

Where do you get all the information from that you need?

Do you receive more information/communications through E-mail or on paper?

Is there a difference between the information you receive through E-mail and paper?

Do you go through the information first thing in the morning?

Do you start with your E-mail or with your In-tray?

Why?

Do you go through everything you receive?

How do you choose the information you process? How do you go about it?

What did you process today?

Give me an estimate, how much of the information you received today was really important/relevant?

Can you give me an example, what information is useful or relevant?

Of the information you receive frequently, what is least relevant?

If you leave some information unprocessed, what do you leave out?

How would you define important information?

Interview 2

From the first round of interviews, it looks like that the strategy used for selecting information for processing (ie. for reading and responding to) is something like this:

- Scan all the information;
- Read those from the Executive and other directors/managers;
- Read those related to your main task/project at the moment;
- Check other instructions/requests for time lines;
- Communications from colleagues who provide useful information.

Leave out:

- Broadcasts
- Copies of information addressed originally to somebody else;
- Changes/updates to administrative procedures;
- Unsolicited commercial information;
- Groupwise Newsletter
- Social Club Newsletters.

Do you agree that this is the strategy you use?

What is your main task/project at the moment?

How many E-mail did you receive today?

What were they about?

- Related to the main task;
- Related to other tasks;
- Organisational/administrative;
- Not relevant to any present task/project;
- Other

Have you responded to any? Which ones?

How many hard copy documents did you receive?

What were they about?

Have you received any other information today, from a meeting, a telephone conversation or informal meeting with someone?

Have you responded yet?

Which ones have you responded to?

Did you receive any important information today? If yes, why is it important?

Everybody seems to agree that there has been an increase in the information. What do you think has caused it?

Do you think that your information load is going to increase or decrease in the immediate future?

If it will increase, how do you think you will cope with it? What would you do?

Do you feel that you should be able to read and take in all the information you receive?

Do you think you ever miss anything really important?

Do you feel that doing your job well depends on being able to process/take in all the information directed to you?

Would you say that there is pressure in the this department to process more and more information?

Sheet1

					Appendix F
Types of Infor-	E-mail	Paper/hard	Meetings	Telephone	Fax
mation		copy			
Broadcasts'					
all staff					
Broadcasts' all					
directors/					
managers					
cc. Copies of in-					
formation					
Administrative/					
departmental					
procedures					
Announcements					
of meetings,					
agendas, minutes					
Information					
connected to					
project/task					
Progress reports					
from staff					
Requests for					
comments					
Articles, journals					
reports					
Ministerials,					
Parliamentary					
Questions,					
Briefings					
Requests for					
information/					
assistance					
How many E-mails did your					
receive today?					
How many paper/					

Sheet1

hard copy?					
How many items were of immediate importance?					